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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
HOWARD, ZACHARY C	

ART UNIT	PAPER NUMBER
1646	

DATE MAILED: 12/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/763,190	FISHMAN ET AL.	
	Examiner	Art Unit	
	Zachary C. Howard	1646	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 September 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6,10,12-15,17 and 25-29* is/are pending in the application.

4a) Of the above claim(s) *3-6,13-15 and 26-29* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,10,12,17 and 25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☒ Claim(s) *1-6,10,12-15,17 and 25-29* are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Status of Application, Amendments and/or Claims

The amendment of 9/6/05 has been entered in full. Claims 1, 10, 12, 13, and 25 are amended. Claims 7-9, 11, 16 and 30-31 are canceled.

Claim 17 is listed in 9/6/05 claim amendments as "Currently Amended"; however there are no amendments indicated in the claim, and there is no difference between the claim as currently and previously presented (1/13/05).

Claims 3-6, 13-15 and 26-29 remain withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to nonelected species, there being no allowable generic or linking claim.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1, 2, 10, 12, 17 and 25, in so far as they are drawn to the elected species, are under consideration in the instant application.

Specification

1) The new title is accepted.

2) The disclosure is objected to because the Brief Description of Figure 10 does not explain the Figure. For example, there is no indication of what sample I, sample II or lanes 1-3 represent. Appropriate correction is required.

Withdrawn Objections and/or Rejections

The following page numbers refer to the previous Office Action (4/5/05).

All rejections of claims 7-9, 11, 16 and 30-31 are *withdrawn* in view of Applicants' cancellation of these claims.

The objection to Figure 10 of the drawings at pg 3-4 is withdrawn in *view* of Applicants' substitute Figure 10 submitted 9/6/05.

The objection to the specification at pg 4-5 for various reasons (see Action) is *withdrawn* in view of Applicants' 9/6/05 amendments to the specification.

Upon further consideration of the relevant art and the teachings of the instant specification, the rejection of claims 1, 2, 10, 12, 17 and 25 under 35 USC § 112, first paragraph (scope of enablement) at pg 5-10 is *withdrawn* and a new rejection under 35 USC § 112, first paragraph (scope of enablement) is set forth below. Applicants' arguments presented in the response of 9/6/05, and the supplemental response of 9/19/05, have been fully considered in so far as they apply to the new rejection.

The rejection of claims 1, 2, 10, 12, 17 under 35 U.S.C. 112, second paragraph, as being indefinite (at pg 10) is *withdrawn* in view of Applicants' persuasive arguments at pg 20-21 of Applicants' 9/6/05 response. Upon re-consideration the Examiner considers these claims to be broad but not indefinite.

The rejection of claim 25 under 35 U.S.C. 112, second paragraph, as being indefinite (at pg 10) is *withdrawn* in view of Applicants' amendment to claim; however, please see the new rejection under 35 U.S.C. 112, second paragraph, below.

Although not specifically indicated, the declaration submitted on 9/6/05 has been treated by the Examiner as a declaration filed under 35 CFR 1.132. This declaration is sufficient to overcome the rejection of claims 1, 2, 10, 12, 17 and 25 based upon 35 U.S.C. § 102(a) and 102(e) as anticipated by Fishman et al, US Pub. No. 2002/00115635 (pg 11-12 of the 4/5/05 Office Action).

Please see new claim objections and rejections, below.

Claim Objections

Claims 1, 2, 10, 12, 17 and 25 are objected to because the claims encompass non-elected species. Appropriate correction is required.

Applicants' arguments (9/6/05; pg 16) as they pertain to the objection have been fully considered but are not deemed to be persuasive.

Applicants submit that no correction is necessary because the claims will be acceptable once generic claims are found to be allowable. Applicants submit that it is not objectionable to retain claims that encompass non-elected species until the generic claims have been finally rejected.

Applicants' arguments have been fully considered but are not found persuasive. As set forth herein, the generic claims are not allowable and therefore the indicated claims remain objected to because they encompass non-elected species.

Claim Rejections - 35 USC § 112, 1st paragraph, scope of enablement

Claims 1, 2, 10, 12, 17 and 25 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a method of monitoring the effectiveness of IB-MECA in the treatment of HCT-116 colon tumor cell line, PC-3 prostate tumor cell line, or B16-F10 melanoma cell line injected subcutaneously into mice comprising measuring the protein expression of A3AR, PKAc, PKB/Akt, GSK-3β, β-catenin, cyclin D1, c-myc or NF-κβ in the same individual before and after treatment, does not reasonably provide enablement for 1) monitoring effectiveness of treatment of other cancers in an individual; 2) methods using other A3AR agonists; 3) methods using other animals; 4) methods wherein other biological markers or parameters are measured; or 5) methods wherein the effectiveness is based on a comparison between in levels between different individuals. The claims contain subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to use the invention.

The factors considered when determining if the disclosure satisfies the enablement requirement and whether any necessary experimentation is "undue" include, but are not limited to: 1) nature of the invention, 2) state of the prior art,

3) relative skill of those in the art, 4) level of predictability in the art, 5) existence of working examples, 6) breadth of claims, 7) amount of direction or guidance by the inventor, and 8) quantity of experimentation needed to make or use the invention. In re Wands, 858 F.2d 731, 737, 8 USPQ2d 1400, 1404 (Fed. Cir. 1988).

The nature of the invention as recited by claim 1 is a method of monitoring the effectiveness of an agent that interacts with the A3 adenosine receptor (A3AR) after administration to an individual with a disease. This method comprises withdrawing a disease-associated cell sample following treatment with an agent that interacts with A3AR; detecting the level of one parameter of A3AR or an element associated with a transduction pathway downstream of A3AR; comparing the level of the parameter to the level prior to administration of an agent, or to the level in an untreated individual; and concluding that a difference in the level is indicative of the effectiveness of said treatment against the disease. The elected species of disease under consideration is colon carcinoma; the elected species of parameter under consideration is protein expression; and the elected species of marker under consideration is A3AR.

Applicants' arguments (9/6/05; pg 16-20 and 9/19/05; pg 1-2) as they pertain to the rejection have been fully considered but are not deemed to be persuasive for the following reasons.

In the response dated 9/6/2005, Applicants submit that the specification is fully enabling for the breadth of the claimed methods. Applicants submit that the present claims have been amended so that they are directed only to cancer or an inflammatory disease. Applicants submit that the specification correlates treatment of melanoma, colon carcinoma, and adjuvant-induced arthritis with expression of A3AR. Applicants submit that the specification (Example 5) and Fishman et al (2003) provide both in vitro and in vivo correlation between treatment of prostate carcinoma and expression of A3AR. Applicants submit the results of additional experiments that support an additional species of cancer (hepatoma) and inflammatory disease (EAE-a model for multiple sclerosis; these

results were submitted with the 9/19/05 supplemental response). Applicants further submit that the methods have been amended so that the claims are no longer generic to any physiological parameter but instead recite specific parameters (specifically, the level of mRNA or protein expression, level of phosphorylation, or cellular localization). In response to the Examiner's assertion that the only parameter that was correlated was protein expression, Applicants point to several examples in the specification. In support of mRNA expression, Applicants point to Example 2 (pg 24) and Example 9 (pg 27) and submit Madi et al (2003) in support. In support of cellular localization, Applicants point to Examples 1 (pg 22-23) and 2 (pg 24). In support of phosphorylation, Applicants point to Examples 4 and 6 and submit Fishman et al (2004; specifically pg 2467 and Fig 3C). Furthermore, with respect to correlation of the parameters with effectiveness, Applicants point to the specification (pg 5-6 and 7-8) and submit that a person of ordinary skill in the art could understand from the claims how to carry out the invention based on the description in the specification. As example, Applicants submit that one could determine whether a decrease in tumor size was correlated with an increase or decrease in a parameter by administering an A3AR-interacting agent to a subject with a tumor and concurrently following tumor size and the level of various physiological parameters. Applicants further submit claim 25 has been amended to clarify the purpose of the method, which is not to determine whether or not a drug candidate is an A3AR agonist, but rather to determine whether an already known agonist is useful in treating a disease state. Applicants submit that the method of claim 25 will detect an effect on diseased cells through A3AR receptor agonism but not through other mechanisms.

Applicants' arguments have been fully considered but are not found persuasive. The Examiner notes that the claims have been amended as indicated by Applicants. The Examiner does not dispute Applicants observations as reported in the specification and Fishman et al, 2003 and Fishman et al, 2004.

It is noted that the hepatoma and EAE data submitted on 9/19/05 are not found to be persuasive. Specifically, Applicants' argument is not persuasive because the evidence in the unpublished manuscript must be submitted in the form of a declaration under 37 C.F.R. 1.132. An unpublished manuscript is not proper evidence, since it has not been peer-reviewed and its contents have not been attested to under 37 CFR 1.132. However, if submitted under 1.132, the results in the manuscript would still not be persuasive for the reasons set forth below.

The amended claims lack enablement for the following reasons. The elected species of disease under consideration is colon carcinoma. However, it is noted that the same arguments apply to treatment of other forms of cancer such as prostate cancer and melanoma.

1) Applicants' claimed methods encompass monitoring the effectiveness of an administered A3AR-interacting agent in the treatment of colon carcinoma in an individual. However, Applicants do not teach whether or not an A3AR-interacting agent is actually effective in treating colon carcinoma. Applicants only teach treatment of a human colon cancer cell line subcutaneously injected in mice. The specification teaches that nude mice were used, and "HCT-116 human colon carcinoma cells...were inoculated subcutaneously to the flank of the mice" (see pg 31). The tumor-bearing mice were treated orally with IB-MECA, which "markedly suppressed the development of colon carcinoma cells" (see pg 38 and Fig 5a). The specification provides no other teachings regarding in vivo treatment of colon cancer with A3AR agonists. While Applicants' examples provide enablement for HCT-116 colon cancer cell lines subcutaneously implanted in mice, they do not provide enablement for treatment for other colon cancer cell lines, or for treatment of "native" tumors.

First, it is not clear that all colon cancer cell lines can be treated effectively with IB-MECA. Colon cancer cell lines are highly selected cells and different lines do not necessarily express the same proteins at the same levels. It is not clear why HCT-116 was chosen and if it representative of all colon tumor cell lines. It is

unpredictable whether or not other colon cancer cell lines could be treated with IB-MECA when subcutaneously implanted in mice.

Second, with regard to "native" tumors, the relevant art cautions that cancer cell lines are not necessarily representative of in vivo derived tumor cells. Kobaek-Larsen teaches, "Cell lines are highly selected cells, usually monocultures, which have the ability to grow in vitro. Furthermore, cell lines are far away from their origin, due to multiple cell divisions and animal passages. Therefore, tumor cell lines may not be representative of in vivo derived tumor cells. When working with cell lines, it is considered essential that the characteristics of the cell lines be examined and described in detail...Instead of using highly selected cell lines, transplantation of intact tumor tissue can be performed to avoid disruption of tissue integrity and change of cell characteristics" (see page 22). Furthermore, in a review directed to adenosine receptors as targets for antitumor therapy, Merighi specifically teaches with respect to A3AR, "We have to be cautious in our interpretation of the current data because of certain obvious limitations. Firstly, though tumor cell lines and xenografts are well-accepted and important experimental models, they clearly do not mimic natural tumors exactly. Furthermore, additional analysis of larger series of experiments is nevertheless necessary to test whether adenosine receptor stimulation and/or blockage really leads to new information reliable enough to have an impact on how cancer patients should be treated" (see pg 43-44 of Merighi et al, 2003, Pharmacology and Therapeutics. 100: 31-48).

Third, the relevant art cautions that the subcutaneous microenvironment is different from that of the colon environment, and that orthotopic sites (i.e., in the colon) are necessary. Heijstek teaches, "a major disadvantage is that the subcutaneous (ectopic) microenvironment greatly differs from that of the colon or the liver. Interactions between the host environment and the tumor graft determines tumor cell expression profiles, the levels of growth factors and nutrients, as well as tumour angiogenesis and metastatic behavior...Orthotopic and ectopic organ environments differentially influence the sensitivity of tumor

cells to chemotherapeutics" (see pg 20 of Heijstek et al, 2005. Dig Surg. 22: 16-25). Kobaek-Larsen teaches: "The subcutaneous route is often used because of its ease and minimal trauma for the laboratory animal. However, it does not mimic the original anatomic site of CRC. Furthermore, cells implanted SC often change their phenotype, and often fail to metastasize...As the microenvironment of the subcutaneous area is different than that of the colon, other implantation sites and strategies are considered necessary" (see pg 22 of Kobaek-Larsen et al, 2000. Comp Med. 50(1): 16-26).

2) Applicants' claims are directed to a method of determining the effectiveness of any A3AR-interacting agent (agonist or antagonist) in treating a specific disease states (e.g., colon carcinoma) by monitoring certain markers (e.g. protein expression of A3AR). To practice the invention as claimed, one of skill in the art would need know that a correlation exists between the difference in the level of the measured marker and effective in vivo treatment of the disease state, and that this correlation would hold for any tested A3AR-interacting agent. However, the relevant art teaches a large genus of adenosine receptor agonists, each with a different potency and selectivity for the A1, A2A, A2B and A3B adenosine receptors (see Table 1; pg 446 of Muller et al, 2003. Curr Top Med Chem. 3(4): 463-462.). Applicants have only tested a single species of agonist, IB-MECA, which has high selectivity for the rat A3AR receptor (versus the other adenosine receptors). However, other adenosine agonists (e.g., NECA) are much less selective. Muller teaches, "A comparison of the nonselective NECA and the A3-selective MECA illustrates that subtle structural changes (ethyl versus methyl in MECA) may result in considerable selectivity differences (see pg 446)." Furthermore, the relevant art teaches that, "Receptor exhibition and spread is not the only factor determining cell response to a particular ligand. An additional parameter is the exhibition of A2A and A2B adenosine cells surface receptors, known to elicit opposite effects to that of A3AR. A3AR agonists, at high concentrations, may also activate A2A and A2B adenosine receptors, affecting the balance of the response" (see pg 463 of Fishman et al, 2003,

Current Topics in Medicinal Chemistry, 3: 463-469). These teachings cast doubt on whether the entire genus of A3AR agonists, which exhibit considerable variability in selectivity and potency, will be effective in treatment of colon carcinoma.

3) The claimed methods encompass any species of mammal, e.g. mice or humans. However, the relevant art cautions "Species differences for A3ARs are larger than for other AR subtypes, particularly between rodent and human receptors (only 74% sequence identity between rat and human A3 amino acid sequence...This results in different affinities of ligands – particularly antagonists – for rat versus human A3 receptors. Furthermore, the tissue distribution of A3ARs is very different in rat as compared to man. In rat, A3ARs are expressed in high density in testis and mast cells and lower density in most other tissues...In humans highest A3 receptor densities are found in lung, liver, and cells of the immune system (neutrophils, eosinophils, T-lymphocytes), but not on mast cells..." (see pg 445 of Muller, supra). The differences in the pattern and level of expression introduces unpredictability into the use of the agonists for treatment, especially in view of teachings of the art that different second messenger pathways are activated at different concentrations. Muller teaches, "...there are indications that A3 receptor agonists may activate different second messenger systems at different concentrations" (see pg 446).

4) The claimed methods encompass methods of treatment of colon carcinoma by measuring any "physiological parameter" of a marker, wherein the marker is A3AR or any element associated with a down-stream signal transduction pathway. The elected species under consideration are A3AR (marker) and protein expression (physiological parameter). In so far as the claims are directed to the elected species of disease under consideration (colon carcinoma) the claims are enabled for monitoring the effectiveness of IB-MECA by measuring the protein expression of A3AR, PKAc, PKB/Akt, GSK-3β, β-catenin, cyclin D1, c-myc or NF-κβ. The specification teaches down-regulation of A3AR, PKAc, PKB/Akt, β-catenin, cyclin D1, c-myc or NF-κβ, and up-regulation

of GSK-3β in tumors whose growth was inhibited by IB-MECA administration (see Fig 7 and pg 38-39). Fishman et al (2003), submitted by Applicants with the supplemental response of 9/16/05, confirms these results for A3AR and six of the seven other proteins (see pg 2466 and Fig 1). However, these results are all directed to measurement of protein expression. The specification provides no teachings directed to colon cancer in which mRNA expression, protein localization, or phosphorylation was measured, and it is not predictable based solely on the protein expression that the other parameters will also be correlated with the effective treatment. For example, a change in protein expression can be due to a change in transcription, translation, or the rate of degradation of the protein. Therefore, the level of mRNA may not change despite a change in the level of protein. To use the level of mRNA to determine if a treatment is effective, one of skill in the art would need to measure the in vivo level of mRNA in individuals in which treatment is effective. Applicants argue that the specification discloses measurement of mRNA expression (Example 2; supported by Madi et al, 2003) and cellular localization (Examples 1 and 2). However, all of these disclosures (Examples 1, 2 and Madi) are directed to measurement of mRNA expression in melanoma cells in vitro. The in vivo microenvironment is not necessarily the same as in vitro and melanoma cells do not necessarily share the same regulatory processes as colon carcinoma cells. Therefore, these results do not speak to measurement of mRNA expression in colon carcinoma cells in vivo. In support of phosphorylation, Applicants submit Fishman et al (2004) as showing phosphorylation of GSK-3β (pg 2467; Fig 3C). While these results are from a colon cancer cell line, it remains that they were performed in vitro. Furthermore, they speak only to GSK-3β and not any of the other markers, which may or may not be phosphorylated in response to IB-MECA.

Furthermore, the claims are directed to any possible element associated with downstream of A3AR. While Applicants have demonstrated changes in A3AR protein expression, and seven other proteins associated with pathways downstream of A3AR, they have not demonstrated that the entire genus of

markers associated with A3AR signaling exhibit changes in protein expression such that they can be used as a maker. As the relevant art teaches, "The four adenosine receptors couple, via G proteins, to an intricate network of signaling pathways...which enables the endogenous modulator to communicate with cells in a very complex manner...In early research on intracellular signal transduction, signaling pathways were described as linear...Nowadays as the network of intracellular signaling is being revealed in increasingly complex detail, the signaling is usually described in terms of a network. Adenosine receptors are no exception" (see pg 815 of Schulte et al, 2003, Cellular Signalling. 15: 813-827.) In Table 1 of Schulte, A3AR is listed as being involved in pathways regulating changes in cAMP, IP3/DAG, choline, K+-ATP channels and chloride channels. The complexity of the pathways linked to A3AR indicates that a large genus of proteins are linked to A3AR, and based on the seven proteins measured by Applicants it is not predictable whether or not the genus as a whole responds to IB-MECA as do those seven proteins.

5) Applicants' claimed methods depend on a comparison between a measurement from a diseased individual and a control level. In claims 1, 2, 10, 12 and 17 the comparison is made to a "control level, being the level thereof in such cells or tissues from the same individual before administration of said agent or being a standard reference for said marker which is indicative of an untreated disease state." With respect to treatment of colon carcinoma in mice, there is no teaching of how the control levels are determined. In the example taught by the specification, the level of the markers is compared between mice with a tumor that are given a control (group of 10) and mice with a tumor that are given IB-MECA (group of 10). It is unclear how to determine the reference level that is indicative of an untreated disease state.

With respect to claim 25, the comparison is made to "the level in diseased cells withdrawn from a subject not administered with said drug candidate." With respect to treatment of colon carcinoma in mice, it is unclear whether or not this method would work. In the example taught by the specification, the level of the

markers is compared between mice with a tumor that are given a control (group of 10) and mice with a tumor that are given IB-MECA (group of 10). The results of the experiment indicate a difference in the A3AR protein expression, but it is not clear whether this is a pool of all 10 individuals or whether this is one representative sample. Looking to Fishman et al 2004 (which Applicants submitted with the 9/19/05 supplemental), it appears that the protein expression was measured in a pooled homogenized tumor sample from 15 mice (see pg 2470). There is no presentation of the range of variation between individuals. Therefore, it is unpredictable whether the claimed method would determine effectiveness if levels were compared between two different individuals.

For the reasons set forth, without further guidance a person of ordinary skill in the art would not be able to make and/or use the invention as claimed without undue experimentation. Due to the large quantity of experimentation necessary to determine if the method could be used to diagnostically test the effectiveness of any A3AR agonist in treating any cancer or inflammatory disease in any species by measuring any parameter of A3AR or any marker associated with a pathway downstream of A3AR, the lack of direction/guidance presented in the specification regarding same, lack of working examples, and the teachings of the prior art and the complex nature of the invention, undue experimentation would be required of the skilled artisan to use the claimed invention. What Applicants have provided is a mere wish or plan and an invitation to experiment to determine whether the method could be used to diagnostically over the full range of the claimed methods.

Claim Rejections - 35 USC § 112, 2nd paragraph

Claim 25 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 25 recites the limitation "said drug candidate" in method steps (i) and (iv). There is insufficient antecedent basis for this limitation in the claim. Applicants have amended (9/6/05) the preamble of claim 25 to remove the term "drug candidate"; however, the method steps still refer to "said drug candidate".

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Zachary C. Howard whose telephone number is 571-272-2877. The examiner can normally be reached on M-F 9:30 AM - 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anthony Caputa can be reached on 571-272-0829. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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Bridget E. Bunner

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PATENT EXAMINER